RELATIONSHIP BASED TASK AND RESOURCE CALL
CENTER MANAGEMENT SYSTEM AND METHOD

1   FIELD OF THE INVENTION

2   The present invention relates to telephone call centers and

3   more particularly, relates to a system and method for managing a

4   call center's task and resources using a relationship based system

5   and method.

6   BACKGROUND OF THE INVENTION

7   A growing number of companies have begun using call centers

8   to handle interactions or communications between customers and

9   potential customers by way of telephone. These call centers

10   provide inbound services, for example, to handle queries from

11   customers to customer service representatives (CSR), and outbound

12   services for managing outbound telephone calls to potential

13   customers for telemarketing and to existing customers for

14   collections, or blended inbound and outbound services. The size

15   of these call centers have increased with companies recognizing

16   the competitive advantage provided by such call centers.

17   Call centers have also implemented other means of

18   communicating and interacting with customers or potential

19   customers such as E-mail and internet chat, and are sometimes

1   referred to as ●ntact centers. The phr● call center is

2   referred to herein as covering the traditional telephone call

3   center as well as contact centers using other means of

4   communication.

5   A typical call center 10, FIG. 1, includes a number of

6   different resources. A telephony/communications system 12

7   establishes the telephony or other type of communication over

8   telephone lines or trunks 14 or over the internet 16 or other type

9   of data network. The telephony/communication system 12 can

10 include standard telephony devices, such as a private branch

11 exchange (PBX), an automatic call distributor (ACD), an

12 interactive voice response (IVR), an automated or predictive

13 dialer, as well as other devices for establishing telephony

14 communications over trunk lines 14. Another example of a

15 telephony device is the Digital Communications Server (DCS)

16 available from Davox Corporation of Westford, Massachusetts. The

17 telephony/communication system 12 can also include an e-mail or

18 web server or other devices for establishing communications over

19 the internet 16.

20   Agent workstations 18 are used by agents or operators to

21 handle the inbound and/or outbound telephone calls or other

22 communications. Each of the agent workstations 18 includes a data

23 terminal 20, such as a PC, for receiving and transmitting data and

24 an audio communications device, such as a headset 22, for

25 receiving and transmitting voice communications. One of the agent

26 workstations 18 can act as a supervisor workstation to be used by

1 a supervisor who oversees the agents and activities in the call

2 center 10.

3 A host system 24 stores information pertaining to the

4 customer, potential customer, or other contacted party. The host

5 system 24 typically includes one or more databases of customer or

6 potential customer information, such as customer records including

7 customer name and telephone number, account information, and the

8 like.

9 A call center management system 26 monitors and manages the

10 call center activities, resources and overall performance and

11 provides a call center manager with call center statistics. The

12 call center management system 26 typically includes one or more

13 servers using a WINDOWS 95/98 or NT operating system or a UNIX-

14 based operating system and including software for managing the

15 call center. One example of call center management software is

16 available from Davox Corporation under the name SMART MANAGEMENT

17 CENTER® (or RESOURCE AND PERFORMANCE MANAGER™). The components or

18 resources of the call center 10 are typically interconnected using

19 a local area network (LAN) 28, such as an ethernet.

20 According to one example of outbound calling using the call

21 center 10, the management system 26 downloads a data file from the

22 host database 24 and converts it to one or more call tables

23 containing call records. A call table is typically associated

24 with a particular application. The numbers in the call table are

25 dialed, either at the request of an agent or automatically, for

26 example, using a predictive dialer. The telephony/communication

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1   system 12 monito●the dialing and when an ans● is detected, the

2   voice is connected to the headset 22 of an appropriate agent at an

3   agent workstation 18, while the corresponding customer record is

4   automatically sent to the data terminal 20 at the available agent

5   workstation 18.   The call center management system 26 monitors the

6   characteristics   and   availability   of   the   agents   and   determines

7   which of the agents is appropriate to handle the calls.   The agent

8   can then enter additional data pertaining to the customer and can

9   record   the   results   of   the   call.   This   sequence   of   events

10   continues until all of the calls in the list are made and is often

11   referred to as an outbound call campaign.

12   According to one example of inbound call handling in the call

13   center 10, when an inbound call is received over one of the trunk

14   lines 14, the ACD within the telephony/communication system 12

15   connects the inbound call to an agent headset 22 of an appropriate

16   available   agent.   If   no   agents   are   currently   available,   the

17   inbound call may be placed into an ACD queue until an agent is

18   available.   The management system 26 can determine which agent is

19   available and appropriate, for example, based upon the purpose of

20   the   call,   the   language   being   used,   or   other   attributes.   The

21   management system 26 also searches for information pertaining to

22   the calling party, retrieves that information from the host system

23   24, and transfers that information to the PC 20 at the workstation

24   18 of the available agent.

25   As   the   call   center   performs   the   inbound   and   outbound

26   services,   the   call   center   management   system   26   monitors   the

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1 activities and resources, such as how many calls have been made,

2 how long is the average agent talk time, what is the status of the

3 queue or the agent, the number of contacts made by each agent, and

4 the like. The management system 26 also provides a graphical user

5 interface, sometimes referred to as a call center console, to

6 display these call center statistics to a viewer (e.g. the call

7 center manager or supervisor) and to allow interaction with the

8 call center operations. Existing call center management software,

9 however, is limited in its ability to interpret data and create

10 information pertaining to the call center resources, to take

11 actions in response to that information, and to group and display

12 that information according to selected resources in the call

13 center.

14 These call center consoles attempt to take call center data

15 and present it to the call center manager in a manner that is easy

16 to understand and interpret. Using these existing call center

17 consoles, however, the call center manager must interpret the data

18 provided and respond with one or more actions. The current

19 console presents data in a visual format but does not provide an

20 interpretive view. For example, a manager or supervisor can see

21 how many calls have resulted in a successful contact for each

22 agent but cannot see at a glance which agents are meeting their

23 contact per hour goals and which are not. In other words, the

24 supervisor has to look at each agent's statistics, interpret the

25 information, and make a decision.

26 Existing call center management systems also are capable of

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1   quantifying call center data and presenting it information, for

2   example, in standard telemarketing reports.   In the existing

3   systems, however, these reports are built based on an established

4   definition of how the information should be quantified and

5   presented. Every call center is managed differently, and standard

6   reports typically do not meet all of the needs of a particular

7   call center.

8   Accordingly, a needs exists for an interactive call center

9   management system that permits a call center manager to define an

10   interpretive view of the call center data and apply it to the

11   console displays. A system is needed in which managers can define

12   their strategies and goals and use that information to dynamically

13   change the console view, for example, by building and assigning

14   strategies to call center resources, such as queues, campaigns,

15   agents and devices.

16   The best of the current call center consoles, such as the

17   SMART MANAGEMENT CENTER® available from Davox, attempt to automate

18   some of the system's actions in response to system occurrences.

19   One example includes software available from Davox under the name

20   ALERT MANAGER™. The ALERT MANAGER™ software permits a call center

21   manager to specify a threshold for performance and have the system

22   take an action or notify the manager when that threshold is not

23   being met. This and other such action management systems include

24   a predefined group of call center statistics but do not permit the

25   manager to customize either the type of measurement of the

26   specific action or series of actions to take place. Although the

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1 systems are capable of taking an action without intervention,

2 these actions are simple reactions to singular predefined events,

3 and the user typically cannot modify the events or add new events.

4 Accordingly, what is needed is a management system that

5 provides an action strategy instead of simply taking a predefined

6 action in response to a predefined event. A need exists for a

7 management system in which call center managers can define an

8 action or series of actions that should occur in response to

9 information learned by the system, for example, by building and

10 assigning a series of actions to call center events such as goal

11 attainment, system event occurrence or time of day.

12 Existing management systems are also limited in the ability

13 to group information, for example, pertaining to the resources in

14 the call center. The SMART MANAGEMENT CENTER® software available

15 from Davox Corporation permits customers to use workgroups to

16 group information about agents and application groups to group

17 client information pertaining to an application. This system,

18 however, uses predefined categories and does not permit call

19 center managers to define how call center resources, other than

20 agents, should be grouped. Each element in a call center has a

21 relationship to a physical system, staffing model and business

22 object. Existing call center management software does not allow

23 these relationships to be defined.

24 Accordingly, a system is needed in which call center managers

25 have the ability to define relationships, for example, by building

26 and assigning relationships to call center resources, such as

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1 queues, campaign ● agents and devices. A nee ● urther exists for

2 a management system that can be incorporated into an existing call

3 center console such as the RESOURCE AND PERFORMANCE MANAGER™

4 available from Davox Corporation, to enhance it with an

5 interpretive and relational view and to add the ability to define

6 action strategies, resulting in an interactive system instead of a

7 static console view.

8   <u>SUMMARY OF THE INVENTION</u>

9   The present invention features a computer implemented method

10 of managing a call center using relationships. The call center

11 includes a plurality of resources for handling telephone calls and

12 other communication contacts. According to the method, call

13 center resource data corresponding to the resources within the

14 call center is established. The resources are presented to the

15 user, and user selections of selected resources are received. The

16 selected resources are then assigned to a relationship profile. A

17 relationship key field corresponding to the relationship profile

18 is then assigned to the call center resources data for each of the

19 selected resources assigned to the relationship profile. The

20 relationship key field is used to manage the call center, for

21 example, by controlling the views presenting call center data and

22 by controlling the definition of call center strategies.

23   The call center resource data is preferably organized by

24 function into a plurality of resource categories. The method can

25 further include the step of presenting the resource categories to

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1 the user and re●ving a user selection of ●selected resource

2 category. The resources within the selected resource category are

3 then presented for selection by the user.

4 The present invention also features a computer-implemented

5 method of managing strategies and actions in a call center.

6 According to this method, action detail data defining generic

7 actions that can be taken in the call center and goal data

8 defining goals that can be set within the call center are

9 established. The generic actions are presented to the user, at

10 least one user selection of a selected generic action is received,

11 and action detail data for the selected generic actions is

12 displayed. User-defined action detail data specific to the call

13 center is then received and added to the generic action detail

14 data to create an available action.

15 According to this method, the goals defined by the goal data

16 are presented to the user, and at least one user selection of a

17 selected goal and at least one user-defined threshold for the

18 selected goal are received. A user selection of at least one

19 selected available action is then received and assigned to the

20 user-defined threshold for the selected goal such that the

21 selected available action occurs when the user-defined threshold

22 is reached.

23 At least one user defined strategy threshold preferably

24 includes multiple levels of user defined strategy thresholds, such

25 as an optimization minimum, an optimization realization, and an

26 optimization maximum. At least one of the available actions is

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1   selected and assigned to each of the user defined strategy

2   thresholds.   A plurality of selected goals, user defined

3   thresholds, and selected available actions are preferably received

4   and assigned to create at least one strategy profile. A library

5   of strategy profiles can be created such that the user can select

6   a strategy profile from the library depending upon a desired

7   strategy to be implemented in the call center.

8   The present invention also features a method of monitoring

9   and presenting call center statistics. According to this method,

10   a plurality of relationship profiles defining a plurality of

11   relationships between call center resources is established, and a

12   plurality of call center strategy profiles defining a plurality of

13   call center strategies is established.   Each of the call center

14   strategies include a plurality of goals having at last one user

15   defined strategy threshold.   The method also includes receiving

16   call center statistic data pertaining to the call center

17   resources.   A plurality of statistics display options

18   corresponding to the resource relationship profiles are presented

19   to the user. The call center statistics data pertaining to the

20   call center resources assigned to the resource relationship

21   profile corresponding to a selected statistics display option

22   selected by a user is then displayed to the user. When the user

23   defined strategy threshold of one of the plurality of goals has

24   not been reached, an indication is provided to the user.

25   The call center statistic data can include call center queue

26   statistics data or call center agent statistics data.   Queue

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1 statistics data ●organized an displayed acc●ng to call center

2 tasks and further according to task classes within each of the

3 call center tasks. Agent statistics data is organized and

4 displayed according to individual agents and further according to

5 task classes.

6   A plurality of task statistics viewing options corresponding

7 to each of the task classes are presented to the user such that

8 contact statistics data within the task classes corresponding to a

9 selected task statistics viewing option is displayed. The method

10 can also include the step of presenting the user with task

11 statistic viewing option preferences, allowing the user to create

12 a user-defined task statistics viewing option.

13   According to one aspect of the method, the indication

14 provided includes a change in color of a display region containing

15 the call center statistics data corresponding to one of the goals

16 in which the user defined threshold has not been reached.

17 According to another aspect, the method includes the step of

18 presenting the user with a plurality of view formats pertaining to

19 the level of detail and format of the call center statistics data

20 to be displayed. View formats include a summary statistics format

21 and a detailed graphical statistics format.

22   The present invention also features call center management

23 systems for performing the methods described above.

24   DESCRIPTION OF THE DRAWINGS

25   These and other features and advantages of the present

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1   invention will ⬤ better understood by re⬤ng the following

2   detailed description, taken together with the drawings wherein:

3   FIG. 1 is a schematic block diagram of a call center,

4   according to the prior art on which can be practiced the present

5   invention;

6   FIG. 2 is a functional block diagram of a call center

7   management system, according to the present invention;

8   FIG. 3 is a flow chart illustrating a method of creating

9   relationship profiles for use in managing the call center,

10   according to the present invention;

11   FIG. 4 is a flow chart illustrating a method of creating

12   available actions for use in managing the call center, according

13   to the present invention;

14   FIG. 5 is a flow chart illustrating a method of creating

15   strategy profiles for use in managing the call center, according

16   to the present invention;

17   FIG. 6 is a flow chart illustrating a method of displaying

18   call center statistics using defined relationship profiles,

19   according to the present invention;

20   FIG. 7 is a flow chart illustrating a method of displaying

21   call center statistics using defined strategy profiles, according

22   to the present invention;

23   FIG. 8 is a screen shot of the user interface for the

24   relationship manager, according to one embodiment of the present

25   invention;

26   FIG. 9 is a screen shot of the user interface for the action

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1 builder, accordi●to one embodiment of the pr●nt invention;

2   FIG. 10 is a screen shot of the user interface for the

3 strategy manager, according to one embodiment of the present

4 invention;

5   FIGS. 11-17 are screen shots of the user interface for the

6 queue statistics display, according to one embodiment of the

7 present invention; and

8   FIGS 18-22 are screen shots of the user interface for the

9 agent statistics display, according to one embodiment of the

10 present invention.

11   DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

12   The call center management system 30, FIG. 2, according to

13 the present invention, includes a relationship management system

14 32, a strategy and action management system 34, and a statistics

15 monitoring and display system 36. The systems 32, 34, 36 are

16 preferably implemented as software on one or more computers in a

17 call center 10 (FIG. 1). In one example, one or more of the

18 systems 32, 34, 36 are incorporated into an existing call center

19 management system 26 such as the software available from Davox

20 Corporation under the name RESOURCE AND PERFORMANCE MANAGER and

21 running on a PC platform in a WINDOWS 95/98 or WINDOWS NT

22 operating system environment. One or more of the systems 32, 34,

23 and 36 can also be used with other types of call centers and call

24 center management software operating on other hardware platforms

25 with other types of operating systems. The call center management

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1 system 30 of the present invention is typically used by a call

2 center manager, supervisor, or administrator, collectively

3 referred to herein as the user.

4 The relationship management system 32 allows call center

5 resources to be grouped such that the user can see the results and

6 activities of the call center as they relate to the resources in

7 each group. Call center resources include agents, trunk lines,

8 workgroups, devices, queues, applications, campaigns, and call

9 tables as well as any other call center resource not yet defined.

10 The relationship management system 32 includes call center

11 resource data 40 defining each of the resources available in the

12 call center. A relationship manager 42 provides a graphical user

13 interface for building and defining relationships by allowing the

14 user to select resources defined by the call center resource data

15 40, as will be described in greater detail below. The

16 relationship manager 42 also permits the user to save the

17 combinations of selected resources as relationship profiles 44,

18 which can be modified using the relationship manager 42.

19 The strategy and action management system 34 allows the user

20 to define the corresponding actions that should be taken when

21 information is learned and as conditions change in the call

22 center. The strategy and action management system 34 includes

23 predefined action detail data 50 defining generic actions that can

24 be taken in the call center. An action builder 52 provides a

25 graphical user interface that allows the user to select the

26 generic actions defined by the action detail data 50 and customize

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1 the generic acti⬤ by adding action details s⬤ific to that call

2 center. The action builder 52 thereby builds a series of

3 available actions 54 that can take place in the system, for

4 example, as part of a strategy, as will be described in greater

5 detail below.

6 The strategy and action management system 34 also provides

7 the ability to define strategies such that the available actions

8 54 can take place when a goal or threshold is being approached.

9 The strategy and action management system 34 includes goal data 56

10 defining various goals to be achieved within the call center. A

11 strategy manager 58 provides a graphical user interface for

12 allowing the user to set one or more thresholds corresponding to

13 the goals defined by the goal data 56 and for assigning one or

14 more of the available actions 54 to the goal thresholds. The

15 strategy manager also permits the user to save the goal thresholds

16 and assigned actions as strategy profiles 60. The strategy

17 manager 56 can also use the relationship profiles 44 to define

18 goals and create strategy profiles 60 that apply to a specific

19 relationship profile.

20 A statistics display system 36 monitors and displays call

21 center statistics in a user-defined format. The statistics

22 monitoring and display system includes statistics data 62

23 collected from the resources throughout the call center. A

24 statistics display manager 64 monitors the statistics data and

25 organizes and presents the statistics data 62 based upon the

26 relationship profiles 44 and strategy profiles 60. The statistics

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1 display manager ● can display the statisti● pertaining to a

2 selected user-defined relationship profile 44 and provides an

3 indication when a user-defined threshold defined by one of the

4 strategy profiles 60 has been reached, as will be described in

5 greater detail below.

6   One method of managing relationships in a call center,

7 according to the present invention, is illustrated in FIG. 3.

8 According to this method, the resources within the call center are

9 identified and resource data 40 is collected, step 202. In one

10 example, a set of system administration tools can be used to

11 define resources. These tools typically include a series of

12 graphical screens to permit the setup of the individual device

13 resources that are applicable to the system. A separate interface

14 can be used for each device type, such as telephony (e.g., PBX,

15 ACD and telephones), IVR, Voice Recording and external devices

16 (e.g., e-mail, web and fax servers). Agent resources can be

17 defined through an agent management interface.

18   When the user activates the relationship manager 42, the

19 relationship manager 42 opens and displays the graphical user

20 interface, for example, on the call center manager's data

21 terminal, step 204. The relationship manager 42 also retrieves

22 and presents the call center resource data 40 to the user in the

23 graphical user interface.

24   One example of the graphical user interface generated by the

25 relationship manager 42 is a relationship management window 70,

26 FIG. 8, having a relationship assignment region 72 that displays

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1   the available call center resources defined by the resource data

2   40.   The available resources are preferably organized and

3   displayed according to resource functional categories. Although

4   the exemplary functional categories are shown as Inbound DNIS,

5   Outbound Tables, Outbound Applications, IVR Applications, Agent

6   Workgroups, and Individual Agent, other functional categories are

7   contemplated.

8   The user can then open an existing relationship profile or

9   add a new relationship profile, step 206.   Each relationship

10   profile   can   include   agents,   workgroups,   devices,   queues,

11   applications, campaigns and call tables, as well as other

12   resources not yet defined.   In the exemplary embodiment, the

13   existing relationship profiles are displayed in a relationship

14   profile region 74 of the relationship management window 70.   The

15   new relationship profiles are added in an add relationship profile

16   region 75 of the relationship management window 70 by naming the

17   relationship   profile   and   providing   a   description   of   the

18   relationship profile. When the relationship manager 42 receives a

19   user selection of a resource functional category, step 208, the

20   available resources within the selected resource functional

21   category are displayed, step 210.   In the exemplary embodiment,

22   the resource functional categories are presented to the user in a

23   drop down list 76.

24   When a user selection of one or more resources within the

25   selected resource functional category is received, step 212, the

26   user   selected   resource   is   assigned   to   the   current   (new   or

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1   existing) profile step 214. In the exemplary embodiment, the

2   resources that have been assigned to the current profile are

3   displayed in an available relationships region 78 of the window

4   70. The steps of receiving and assigning user-selected resources

5   to the relationship profile can be repeated until the user does

6   not wish to assign any additional resources within that category,

7   step 216. The user can also select another resource functional

8   category, step 218, (e.g., from the drop down list 76) and the

9   steps of receiving and assigning user selected resources within

10   that category can also be repeated until the user has selected and

11   assigned any number of resources to the current profile. The

12   resources can also be organized, displayed and selected using·

13   other methods and formats.

14   When the user is finished creating or modifying the

15   relationship profile, the relationship profile is saved, step 220,

16   and a relationship key field corresponding to the saved

17   relationship profile is created and associated with the resource

18   data for the resources assigned to that relationship, step 222.

19   The relationship key field can be used to sort call center data

20   and to control the views, to define strategies, and to create

21   reports, as will be described in greater detail below. The user-

22   defined relationship key field also provides the ability to group

23   information about resources within an individual call center at a

24   particular site and also to extend the grouping functionality to

25   multiple call centers across an entire enterprise. After creating

26   any number of relationship profiles, the user can exit the

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1   relationship manager 42, step 224, for example by closing the

2   relationship management window 70.

3   Relationship management system 32 of the present invention

4   allows the user to create a hierarchy of relationships within the

5   call center. Corporations, for example, could have a customer

6   service department with all telephony functions within one call

7   center or distributed across many call centers. Within the

8   customer service department, there may be several departments,

9   such as private label, core product, special offerings and

10 acquisitions. Certain call center resources (e.g., agents,

11 queues, campaigns, etc.) may be associated with these departments.

12 The relationship management system 32 allows resource

13 relationships to be defined at each of these levels and across

14 multiple call centers.

15   One method of building actions in a call center, according to

16 the present invention, is illustrated in FIG. 4. According to

17 this method, generic call center actions are initially defined to

18 establish the predefined generic action detail data 50, step 242.

19 When the user activates the action builder 52, the action builder

20 52 opens and displays a graphical user interface, step 244. An

21 example of the action builder interface is an action builder

22 window 80, FIG. 9. The action builder window 80 presents the

23 types of generic actions to the user, for example, in a drop down

24 list 82. When a user selection of an action type is received,

25 step 246, the generic action detail data for the selected action

26 type is displayed, step 248, for example, in an action details

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1   region 84 of the action builder window 80.   User-defined action

2   detail data is then received, for example, in the action details

3   region 84 and is added to the generic action detail data, to

4   create a customized available action, step 250.

5   Examples of actions that can be defined in the call center

6   software available from Davox Corporation include but are not

7   limited to: a send messages action where the user specifies where

8   the message is to be sent (e.g., the agent(s) or workgroup(s));

9   the E-mail notification action where the user specifies the E-mail

10   address; the pages notification action where the user specifies a

11   list of phone numbers; the purge logs action; the move resources

12   to queue action where the user specifies the origin queue and the

13   destination queue; the recycle device action where the user

14   specifies the device (e.g., IVR, CTI, voice recording); the set

15   statistic color action where the user specifies the color; the

16   notification action where the user specifies the screen event; the

17   log action where the user specifies an exception to send to the

18   event log; the combination termination codes action where the user

19   selects multiple termination codes and totals them together for a

20   single display, and the automation script action where the user

21   assigns an automation script to run.

22   The customized available action can be saved, step 252, and

23   also can be displayed in an available action region 86 of the

24   action builder window 80. These steps can be repeated to create

25   any number of available actions, step 254. Once the user has

26   created the desired available actions, the user can exit the

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1   action builder 5●step 256, for example, by ●osing the action

2   builder window 80. The available actions 54 can later be selected

3   and assigned using the strategy manager, as will be described in

4   greater detail below.

5   In one example, if the call center manager or administrator

6   wants to define an action in which agents are moved from one

7   inbound queue to another inbound queue when a certain event

8   occurs, the administrator selects the move resources to queue type

9   of generic action. The administrator then enters the specific

10 details pertaining to the origin queue and the destination queue

11 specific to the particular call center.

12   One method of managing strategies within a call center,

13 according to the present invention, is illustrated in FIG. 5.

14 According to this method, the strategies or goals are initially

15 defined to establish the predefined goal data 56, step 262. When

16 activated by the user, the strategy manager 58 opens and displays

17 a graphical user interface, step 264.

18   One example of the graphical user interface is a strategy

19 manager window 90, FIG. 10. The strategy manager window 90

20 presents the predefined strategies or goals to the user, for

21 example, in one or more drop down lists 92. The user can open an

22 existing strategy profile or add a new strategy profile, 266. In

23 the exemplary embodiment, the existing strategy profiles are

24 displayed in a strategy library region 94 of the strategy manager

25 window 90. New profiles are added in an add profile region 96 of

26 the strategy manager window 90 by naming the profile and providing

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1   a brief description of the profile.

2   The strategies or goals are preferably organized according to

3   goal classes or categories including, but not limited to, system

4   events, service level, volumes, agent, devices, and time of day.

5   Examples of system events goals include Download Process, Upload

6   Process, and System Backup.   Examples of service level goals

7   include Answer Rate, Average Speed Of Answer, Calls Currently In

8   Queue, Longest Time In Queue, Average Time In Queue, Calls Handled

9   In X Seconds, Average Idle Time, Average Wrap Time, Average Talk

10   Time, and Average Hold Time (Agent).   Examples of volumes goals

11   include Total Calls, Agents Currently Logged Into Queue, Calls

12   Abandoned, Calls Transferred, Calls Abandoned From Queue, Calls

13   Abandoned While Ringing, Calls Abandoned From Hold, and Calls

14   Handled By IVR.   Examples of agent goals include Individual Term

15   Code Results, Combination Term Code Results, Manual Make Calls,

16   Actual Hold Time, Actual Talk Time, Actual Wrap Time, Actual Idle

17   Time, Average Hold Time, Average Talk Time, Average Wrap Time,

18   Average Idle Time, Conferences, Transfers, and Abandons On Hold.

19   Examples of devices goals include CTI Link, IVR Link, Voice

20   Recording, DCS, Customer dbase Link, Desktops, Email Server Link,

21   Web Server Link, and Fax Server Link.

22   The user selects a goal category, step 268, and then selects

23   a goal within the selected goal category, step 270. The user then

24   defines at least one strategy threshold for the selected goal,

25   step 272. In the exemplary embodiment, the goals are selected and

26   the thresholds are defined in a strategy details region 98 of the

strategy manager window. The goals are selected using the drop
down lists 92 and the threshold values are entered in the
appropriate box 97. Preferably, multiple thresholds can be
defined for each selected goal, such as an optimization minimum,
and optimization realization, and an optimization maximum.

For each of the one or more strategy thresholds defined by
the user, the user can select one or more available actions 54, as
defined using the action builder 52, to occur when each user-
defined threshold is reached, step 274. In the exemplary
embodiment, the available actions 54 are listed in action
selection regions 99. By defining multiple thresholds for a
selected goal and assigning one or more available actions to each
threshold, the user can define a series of actions to take place
as conditions change in the call center, for example, as the goal
is approached, as the goal is realized, and as the goal is
exceeded.

In one example, a call center has an Average Speed Of Answer
(ASA) goal of 20 seconds. If the ASA drops below 10 seconds,
there are too many agents logged into the queue resulting in a
high agent idle time. The administrator can thus set an
optimization minimum goal at ten seconds such that, if the ASA
dropped below 10 seconds, sequential actions could take place, for
example, send a page to management and move agents from one
inbound queue to another. The administrator can also define an
optimization maximum goal, for example, of 28 seconds, and select
the appropriate actions for the optimization maximum goal.

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1   The user defined thresholds and selected actions are then

2   saved as available goals within the strategy profile, step 276.

3   In the exemplary embodiment, the available goals for a selected

4   strategy profile are displayed in an available goals region 95 of

5   the strategy manager window 90.   The user can then select and

6   define additional goals for that strategy profile as desired, step

7   278.   When the user has finished defining or modifying one or more

8   strategy profiles, the user can exit the strategy manager 58, step

9   280, for example, by closing the strategy manager window 90.

10   The strategy profiles can also be assigned, for example,

11   based upon a day, a time of day, or a relationship profile.   When

12   a strategy profile is assigned to a relationship profile, the

13   goals defined within that strategy profile will apply to the

14   resources within to the assigned relationship profile.   For

15   example, if several queues are defined as belonging to a "customer

16   service gold" relationship profile, a "customer service gold"

17   strategy profile can be created with goals (e.g., e-mail returned

18   within 4 hrs., calls answered within 8 sec., and faxes returned

19   within 20 min.) that apply to the queues within the "customer

20   service gold" relationship profile.   If a new queue is added to

21   the relationship profile, the new queue will have the same

22   strategy assigned to that relationship profile.   If the overall

23   strategy assigned to the relationship profile is not appropriate

24   for a particular resource within the relationship profile, an

25   individual strategy can be devined for that resource.

26   The strategy manager 58 can also define strategy profiles

24

1   that apply 'to resources across different relationships. For

2   example, a "Monday" strategy profile can be defined that gives

3   inbound phone calls the highest priority regardless of whether the

4   inbound queues belong to the "customer service gold" relationship

5   profile. As described in greater detail below, the statistics can

6   then be viewed according to the relationship profile, thereby

7   allowing the user to see how the "Monday" strategy profile affects

8   the queues assigned to the "customer service gold" relationship

9   profile.   This permits a multi-dimensional view of the contact

10   center.

11   One   method   of   organizing   and   presenting   call   center

12   statistics, according to the present invention, is shown in FIGS.

13   6 and 7.   According to this method, the call center statistics

14   data 62 is collected, step 302, for example, using conventional

15   techniques for collecting statistics in a call center.   Upon

16   activation by a user, the statistics display manager 64 opens and

17   displays a graphical user interface, step 304.   According to the

18   present invention, two basic types of statistics can be displayed

19   - queue statistics and agent statistics.

20   According to the exemplary embodiment, the graphical user

21   interface includes one or more queue statistics windows or screens

22   100, 110, 112, FIGS. 11-17, for displaying queue statistics in

23   different formats and levels of detail.   A summary queue

24   statistics screen 100 displays statistics according to call center

25   tasks, for example, inbound, outbound, e-mail and web chat, and

26   permits the user to view the overall performance of the call

25

1 center. The stat[i]stics data corresponding [to] the call center

2 tasks are displayed in appropriate call center task regions 102,

3 for example, in tabular format, within the summary queue

4 statistics screen 100. The statistics can include current

5 statistics updated in regular time intervals (e.g., 1 min.) as

6 well as daily statistics accumulated throughout the day and

7 updated daily.

8 According to the exemplary embodiment, the graphical user

9 interface also includes one or more agent statistics windows or

10 screens 120, FIGS. 18-22, for displaying agent statistics in

11 various formats and levels of detail. An agent statistics summary

12 screen 120 permits the user to view agent activity. The agent

13 statistics are displayed in an agent statistics display region

14 122, for example, in tabular format. The agent statistics can be

15 displayed as per agent hour statistics and daily agent statistics.

16 The method of organizing and presenting the queue or agent

17 statistics includes presenting statistics display options

18 corresponding to the relationship profiles 44, step 306. When

19 the user selects a relationship profile display option, statistics

20 data pertaining to the resources assigned to the relationship

21 profile corresponding to the user-selected display option are

22 displayed, step 308. For example, the statistics display manager

23 64 sorts the statistics data using the relationship key field

24 corresponding to the selected relationship profile display option

25 and displays the corresponding statistics data.

26 In the exemplary embodiment, the summary queue statistics

26

1   screen 100 provides a drop down menu 104 that allows the user to

2   select the display option corresponding to one of the relationship

3   profiles 44. If the relationship profile display option is

4   selected, statistics pertaining to the resources (e.g., queues or

5   campaigns) assigned to that relationship profile will be displayed

6   within the appropriate call center task region 102. Other display

7   options include workgroups, call center tasks, and the entire call

8   center activity.

9   The exemplary summary agent statistics screen 120 also

10   provides a drop down menu 124 that allows the user to select a

11   display option based upon a relationship profile, a workgroup, or

12   agents assigned to specific tasks (e.g., inbound, outbound, e-

13   mail, and web chat). If a relationship profile display option is

14   selected, statistics for the agents assigned to that relationship

15   profile will be displayed within the agent statistics display

16   region 124.

17   The method also includes presenting viewing options

18   corresponding to the type of statistics to be displayed, step 310.

19   When the user selects a viewing option, the type of statistics

20   data corresponding to a user-selected viewing option is displayed,

21   step 312. In the exemplary embodiments, the queue statistics and

22   agent statistics are organized according to categories or classes,

23   and the viewing options correspond to the categories or classes.

24   In the exemplary embodiment of the summary queue statistics

25   screen 100, the user can select a viewing option corresponding to

26   one of the classes from a drop down list 106 within each of the

27

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1 task regions' 102●. The queue statistics class● include, but are

2 not limited to, service level statistics, volume statistics, agent

3 queue statistics, results statistics, routing statistics, IVR

4 statistics, and user defined preferences. Examples of the queue

5 statistics within each of the classes are as follows:

6 SERVICE LEVEL STATISTICS

7 Service Level - Percentage of calls answered within a

8 predefined number of seconds (near real time interval).

9 Number of Calls Abandoned from Queue - Number of calls that

10 reached the queue and the customer hung up (real time interval).

11 Percent of Calls Abandoned From Queue - Number of calls that

12 reached the queue and the customer hung up/Total calls (real time

13 interval).

14 Percent of Calls Abandoned While Ringing - Number of calls

15 that the customer hung up while the phone was ringing (real time

16 interval).

17 Number of Calls Abandoned While On Hold - Number of calls

18 that the agent put on hold and the customer hung up (real time

19 interval).

20 Percent of Calls While On Hold - Number of calls that the

21 agent put on hold and the customer hung up/Total calls (real time

22 interval).

23 Number of Calls Defaulted - Number of calls in a queue that

24 took the default route (near real time interval).

25 Percent of Calls Defaulted - Number of calls in queue that

26 took the default route/Total calls (near real time interval).

28

1   Average Speed Of Answer - Time from PBX arrival to agent

2   answer for all calls/Total calls (real time interval).

3   Age of Oldest Call In Seconds/Minutes - Time of call

4   currently in queue for the longest period of time (real time

5   interval).

6   Average Time In Queue - Only track for calls that are in a

7   queue longer than 1 second - Time from queue arrival to agent

8   answer for all calls/Total calls (real time interval).

9   VOLUME STATISTICS

10   Total Calls - Number of calls that were delivered to the

11   queue (near real time interval).

12   Number of Agent Transfers Within Queue - Number of calls

13   transferred within the same queue (near real time interval).

14   Percent of Agent Transfers Within Queue - Number of calls

15   transferred within the same queue/Total calls (near real time

16   interval).

17   Number of Agent Transfers Out Of The Queue - Number of calls

18   transferred outside the queue the call is currently in (near real

19   time interval).

20   Percent of Agent Transfers Out Of Queue - Number of calls

21   transferred outside the queue the call is currently in/Total calls

22   (near real time interval).

23   Number of Agent Transfers Off Premise - Number of calls that

24   are transferred to a number outside the switch (near real time

25   interval).

26   Percent of Agent Transferred Off Premise - Number of calls

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1 that are transfe●d to a number outside the ●itch/Total calls

2 (near real time interval).

3   Number of Calls In Queue - Total number of calls currently in

4 queue (real time interval).

5   AGENT QUEUE STATISTICS

6   Average Agent Talk Time - Time from call answer to call hang

7 up for all calls/Total calls (near real time interval).

8   Average Agent Wrap Time (After Call Work) - Time from call

9 hang up to receipt of termination code for all calls/Total calls

10 (near real time interval).

11   Average Agent Idle (Ready) Time - Time agents in ready state

12 not on a call for all calls/Total calls (near real time interval).

13   Number of Agents Currently Logged In - Number of agents

14 logged in to this queue (real time interval).

15   Number of Agents In Idle (Ready) State - Number of agents

16 logged in and ready to take calls (real time interval).

17   Number of Agents In Talk State (After Call Work) - Number of

18 agents currently on a call (real time interval).

19   Number of Agents in Wrap (Busy) State - Number of agents

20 currently in the after call work state (real time interval).

21   Number of Agents Allocated To Blend - Number of agents not

22 available to this application because they have been

23 systematically moved to a blend application (real time interval).

24   Percent of Agents Allocated To Blend - Number of agents not

25 available to this application because they have been

26 systematically moved to a blend application/Total agents (near

30

1   real time interva●   ●

2   RESULTS

3   Conversion Rate - Number of calls that result in 'N's

4   termination codes, where 'N's is defined by the customer/Total

5   calls - 'N's result codes (near real time interval).

6   Total 'N' Results - Number of calls that result in 'N's

7   termination code, where 'N's is defined by the customer. 'N' can

8   be one or multiple result codes. Groupings to be defined by the

9   customer (real time interval).

10   'N' Results Per Agent Hour - Total results/Agent hours (near

11   real time interval).

12   Total Dollars - Dollars assigned to total results. Dollars

13   will be definable by the customer by result code. The field will

14   be populated at call completion by the agent client software (near

15   real time interval).

16   Dollars Per Agent Hour - Total dollars/Agent hours (near real

17   time interval).

18   ROUTING STATISTICS

19   ANI Hit Rate - Number of on calls that Ensemble was able to

20   route based on ANI/Total inbound calls (real time).

21   DNIS Routing Rate - Number of inbound calls that Ensemble was

22   able to route based on DNIS/Total inbound calls (real time).

23   Customer Profile dbase (CPdb) outing Rate - Number of inbound

24   calls that Ensemble was able to route based on information

25   contained in the CPdb/Total inbound calls (real time).

26   Legacy Host Look-Up Routing Rate - Number of in calls that

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1   Ensemble was' able to route based on information contained in call

2   center's Legacy Host dbase/Total inbound calls (real time).

3   IVR Routing Rate - Number of in calls that Ensemble was able

4   to route based on information gathered when call was handled by

5   IVR/Total in calls (real time).

6   IVR STATISTICS

7   IVR Calls - Number of calls handled by the IVR (near real

8   time).

9   Total Time In IVR - The amount time the IVR handled the

10   inbound call (near real time).

11   IVR Abandon Calls - Number of calls that abandon will handled

12   by the IVR (near real time).

13   Percentage of IVR Abandon Calls - Number of calls that

14   abandon while handled by the IVR/Total IVR calls (near real time).

15   Total Time In IVR Before Abandon - The amount of time that

16   the IVR was handling the call before the call aborted (near real

17   time).

18   IVR Transfers - Number of calls that enter the IVR and for

19   some reason caller requested to be transferred to a live agent

20   (near real time).

21   Percentage of IVR Abandon Calls - Number of calls that enter

22   the IVR.

23   Total Time In IVR Before Transfer - The amount of time the

24   IVR handled the inbound call before the IVR transferred the call

25   (near real time).

26   IVR Success Rate - Number of IVR calls that resulted in a

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1   successful transaction, such as prompted caller for their SS# and

2   transferred the call to agent pool or handled the inbound call

3   without transferring the call to an agent. A successful

4   transaction is a termination code that is assigned as "Success",

5   similar to terminations code that are classified as contacts in

6   the outbound world (near real time).

7   IVR Termination Codes - An individual termination code sent

8   to Davox indicating that disposition of each call within the IVR.

9   The statistics display manager 64 also allows the user to

10 define preferences for one or more user-defined viewing options.

11 A preference window 110, FIG. 12, presents a list of available

12 statistics in an available statistics region 112 (e.g., a list

13 box). The user can begin a new viewing option, define an

14 alphanumeric name for the viewing option, select the desired

15 statistics from the available statistics region 112, and arrange

16 the statistics in an order of display region 114 of the preference

17 window 110. The user can save the user-defined preference and the

18 user-defined preference then becomes one of the viewing options

19 available to the user in the drop down list 108 on the queue

20 statistics screen 100, FIG. 13. Within each viewing option, the

21 user can also resort the data presented in each row based upon the

22 column header selection (ascending, descending).

23   The exemplary agent statistics screen 120 also presents the

24 viewing options in a drop down list 126 such that the user can

25 select a viewing option and view the agent's performance based on

26 different classes. The agent statistics categories or classes

33

1   include, but are ⬤t limited to, time, volume ⬤f calls, results

2   and agent efficiency.   Examples of the agent statistics within

3   each of the classes are as follows:

4   TIME STATISTICS

5   State - Displays the current agent state Out Talk, Out Idle,

6   Out Wrap, In Talk, In Idle, In After Call Work, Email

7   Correspondence, Web Chart (real time update).

8   Logged In - Agent's total time logged into the system (near

9   real time).

10   Total Talk - Agent's total talk time for all tasks (near real

11   time).

12   Total Idle - Agent's total time spent in idle state for all

13   tasks (near real time).

14   Total After Call Work - Agent's total time spent in After

15   Call Work state for all task (near real time).

16   Total Aux Work - Agent's total time spent in Aux Work state

17   (near real time).

18   Percentage of Agent Time Working Inbound - Agent's total time

19   handling outbound calls/Logged In Time (near real time).

20   Percentage of Agent time Working Outbound - Agent's total

21   time handling outbound calls/Logged In Time (near real time).

22   Percentage of Agent Time Working Email - Agent's total time

23   handling E-mails/Logged In Time (near real time).

24   Outbound Talk - Agent's total talk time when handling

25   outbound calls (near real time).

26   Outbound Idle - Agent's total idle time when handling

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1   outbound calls (near real time).

2   Outbound After Call Work - Agent's total time spent in After

3   Call Work state for outbound calls (near real time).

4   Inbound Talk - Agent's total talk time when handling inbound

5   calls (near real time).

6   Inbound Idle - Agent's total idle time when handling inbound

7   calls (near real time).

8   Inbound After Call Work - Agent's total time spent in After

9   Call Work state for inbound calls (near real time).

10   Email Correspondence - Agent's total time spent corresponding

11   to E-mails (near real time).

12   Web Chat Time - Agent's total time spend interacting with

13   customers via Web Chat (near real time).

14   Scheduled Break 1 - Total time agent spent on break 1 (near

15   real time).

16   Scheduled Break 2 - Total time agent spent on break 2 (near

17   real time).

18   Scheduled Break 3 - Total time agent spent on break 3 (near

19   real time).

20   VOLUME STATISTICS

21   Total Calls - Number of calls that were delivered to the

22   agent for all Tasks (real time).

23   Inbound Calls - Number of inbound calls that were delivered

24   to the agent (real time).

25   Outbound Calls - Number of outbound calls that were delivered

26   to the agent (real time).

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1   E-mails' - Number of E-mails that were delivered to the agent

2   (real time).

3   Percentage of Inbound Calls Worked - Number of inbound calls

4   that were delivered to the agent/Total Calls (real time).

5   Percentage of Outbound Calls Worked - Number of outbound

6   calls that were delivered to the agent/Total Calls (real time).

7   Percentage of E-mails Worked - Number of E-mails that were

8   delivered to the agent/Total Calls (real time).

9   Number of Inbound Calls Transferred Within Queue - Number of

10   inbound calls that the agent transferred within the queue (real

11   time).

12   Percentage of Inbound Calls Transferred Within Queue - Number

13   of inbound calls that the agent transferred within the queue/Total

14   inbound calls (real time).

15   Number of Inbound Calls Transferred Out of the Queue - Number

16   of inbound calls that the agent transferred out of the queue (real

17   time).

18   Percentage of Inbound Calls Transferred Out of Queue - Number

19   of inbound calls that the agent transferred out of queue/Total

20   inbound calls (real time).

21   Percentage of Inbound Calls Transferred - Number of inbound

22   calls that the agent transferred/Total inbound calls (real time).

23   Number of Inbound Calls Transferred Off premise - Number of

24   inbound calls that the agent transferred off premise (real time).

25   Percentage of Inbound Calls Transferred Off Premise - Number

26   of inbound calls that the agent transferred off premise/Total

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inbound calls (real time).

Number of Outbound Calls Transferred - Number of outbound calls that the agent transferred (real time).

Percentage of Outbound Calls Transferred - Number of calls that the agent transferred/Total outbound calls (real time).

RESULTS STATISTICS

Conversion Rate - Number of calls that result in 'N's termination codes, where 'N' is defined by the customer/Total calls - 'N's result codes (real time).

Total 'N' Results - Number of calls that result in 'N' termination codes, where 'N's is defined by the customer. 'N' can be one or multiple result codes. Groupings to be defined by the customer (real time).

'N' Results Per Agent Hour - Total results/Agent hours (real time).

Total Dollars - Dollars assigned to total results. Dollars will be definable by the user by result code. The field will be populated at call completion by the agent client software (real time).

Dollars Per Agent Hour - Total dollars/agent hours (real time).

The user can also define agent statistics viewing options using a preferences window 130, FIG. 19. The preferences window 130 presents a list of available statistics in an available statistics region 132 (e.g., a list box). The user can begin and name a new viewing option preference, select statistics to be

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1 included in that reference from the available statistics, and

2 arrange the statistics in an order of display region 134 of the

3 preferences window 130. The user-defined viewing option can then

4 be saved and presented in the drop down list 126 of the agent

5 statistics window 120, FIG. 20.

6   The method of organizing and presenting statistics also

7 presents view format options corresponding to the level of detail

8 and format of the statistics, step 314. Upon receiving a user

9 selection of one of the view format options, the statistics data

10 is displayed in the user selected view format, step 316.

11   In the exemplary embodiment, the queue statistics interface

12 provides two basic view formats or levels of statistical

13 information, summary and detail.   The queue statistics summary

14 screen 100 (as shown in FIG. 11) provides a global view of all

15 activity in the call center. The statistics detail screens 116,

16 FIGS. 14-17, provide an in-depth view into a specific call center

17 task in a graphical format. The queue statistics summary screen

18 100 preferably includes icons 108 associated with statistics, for

19 example, associated with each queue within the inbound tasks and

20 with each campaign within the outbound tasks.   The icons 108

21 provide a link to the queue statistics detail screens 116 for the

22 associated statistics.

23   When the detail graphic icon 108 is selected for a particular

24 queue or campaign, the detail information for that queue or

25 campaign will be displayed in a graphical format in separate queue

26 statistics detail screens 116a-116d (FIGS. 14-17).   The queue

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1   statistics detail screens 116a-116d initially display graphical

2   representations of the statistics according to the viewing option

3   set in the summary queue statistics window 100. Within each of

4   the queue statistics detail screens 116a-116d, the user can change

5   the viewing option and the statistics and graphical format will

6   change accordingly. For example, the service level viewing option

7   is shown in the window 116a (FIG. 14), the agent viewing option is

8   shown in the window 116b (FIG. 15), and the volume viewing option

9   is shown in window 116c (FIG. 16).

10   In the exemplary embodiment, the agent statistics interface

11   also provides different view format options having different

12   levels of detail and different data formats. A quick view agent

13   statistics screen 136, FIG. 21, allows the user to view the

14   overall performance of the agents including the task (e.g.,

15   inbound, outbound, Email, chat) a specific agent has logged into

16   and the login state. Login states include, but are not limited

17   to, logged in, ready waiting for work, after call work, busy,

18   break, paid break, and logged out. The quick view agent

19   statistics screen 136 can also display color codes to indicate the

20   task and login state of each agent.

21   A detail view agent statistics screen 138, FIG. 22, displays

22   statistics for a specific agent in graphical format. The agent

23   statistics summary screen 120 preferably includes icons 128

24   associated with each agent. Activating the icons 28 opens the

25   detail view format screen 138 associated with that agent.

26   For both queue and agent statistics, multiple statistics

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1　windows or screen can be opened simultaneously with different

2　display options, viewing options, and/or view format options

3　selected for each window.

4　　One method of monitoring statistics, according to the present

5　invention, is illustrated in FIG. 7. According to this method,

6　the statistics collected by the call center are compared to the

7　user-defined goal thresholds in a strategy profile, step 320. If

8　one of the user-defined thresholds is not being met, step 322, an

9　indication is provided in the region of the statistics interface

10　containing the statistics that fail to meet the user-defined

11　threshold, step 324.

12　　According to the exemplary embodiment, the statistics are

13　displayed within cells 109 in the queue statistics window 100. If

14　an established goal is not being met, the cell for that particular

15　statistic element will change colors notifying the user that the

16　call center is not meeting a user-defined goal threshold that

17　applies to that statistic element. Different colors can also be

18　used to indicate when the statistics are within the optimization

19　minimum or optimization maximum. Thus, the user is informed of

20　the approach, realization, and exceeding of the goal associated

21　with that statistic.

22　　The exemplary agent statistics screen 120 also displays each

23　statistic element in a separate cell 129. If an agent is not

24　meeting an established goal, the cell 129 for the agent statistic

25　element will change colors notifying the user that the agent is

26　not meeting the user-defined goal.

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1   Accordingly, the present invention provides an interactive
2   call center management system that provides an interpretive view
3   of the call center data and that permits a call center manager to
4   define relationships between call center resources, to define
5   strategies and goals, to define a series of actions to take place
6   when the goals are met.

7   Modifications and substitutions by one of ordinary skill in
8   the art are considered to be within the scope of the present
9   invention which is not to be limited except by the claims which
10   follow.

11   What is claimed is:

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